
THE EFFECTIVENESS OF AIDS EDUCATION

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Prologue: *Introducing a hearing before the Senate Governmental Affairs Committee on the effectiveness of acquired immunodeficiency syndrome (AIDS) education in June 1988, Sen. John Glenn (D-OH) said: "As scientists race against the clock to create the drugs that will allow persons with AIDS to lead normal lives, we are reminded that the simplest, cheapest, and most effective method of fighting AIDS is by educating the public on how to avoid it." The U.S. General Accounting Office (GAO) and the congressional Office of Technology Assessment (OTA) both produced reports in 1988 on the status of government-funded AIDS education. GAO focused its report on efforts to reach populations at risk. OTA's task was to assess the effectiveness of AIDS education; in the process, OTA researchers found that most programs were not designed in such a way to make evaluation possible. The OTA study's director, Jane Sisk, testified before Glenn's committee that without the insights gained by evaluating educational programs rigorously, "those planning [such programs] cannot determine which components are vital for success . . . Such information is especially important because public health programs at all levels of government face restricted budgets." In this article, Sisk and her OTA colleagues summarize the report's major findings and recommendations. Sisk, who holds a doctorate in economics from McGill University, has worked at OTA since 1976, taking the years 1978 to 1981 to participate in the scholar's program of the Veterans Administration. In Summer 1987 she published a review of AIDS cost estimates in Health Affairs; she now plans to update that earlier cost review. Maria Hewitt, an OTA analyst, holds a doctor of public health degree from the University of California, Los Angeles. In working on a recent study of medical testing and health insurance, she has examined the role of screening for the human immunodeficiency virus (HIV) in a person's ability to obtain health insurance. Kelly Metcalf, a research analyst, has devoted her time at OTA to AIDS and to adolescent health.*

Experts on acquired immunodeficiency syndrome (AIDS) have repeatedly emphasized education as the primary means to prevent further spread of infection and disease. The human immunodeficiency virus (HIV), which causes AIDS and other disorders, may be transmitted from an infected to an uninfected person through blood, semen, and vaginal fluid. Since testing blood donations began in 1985, a person in the United States becomes at risk of infection chiefly by engaging in practices that transfer these fluids from an infected person through sexual intercourse or by sharing equipment associated with intravenous (IV) drug use. Infected women also may transmit the virus to their babies during the perinatal period. Thus, prevention of new HIV infections lies largely within the control of individuals.

As for other sexually transmitted diseases (STDs), governments and communities using educational interventions can play important roles in HIV control by communicating information, fostering social support, and providing the means for people to change and maintain certain behaviors. Education not only holds out the promise of limiting further HIV infection; in the absence of an effective vaccine or therapy to cure AIDS, it offers the only current defense against infection and disease.

Increasingly during recent years, both Congress and the Reagan administration have stressed the importance that they place on AIDS education. AIDS education has been the subject of several congressional hearings and proposed legislation. Federal programs related to AIDS education have grown in number and funding. Although some have questioned whether these efforts have been sufficient, verbal support for general AIDS education and monetary support for specific grants and other activities have increased.

Because of the reliance being placed on education, it is important to ask what type of program has proven to be effective in influencing people's behavior. This article reviews what is known about the effectiveness of AIDS education for the general population and for those people exhibiting high-risk behavior: certain male homosexual practices, IV drug abuse, certain heterosexual practices among adults, and certain practices among school-age youth. Based on this review, the article identifies deficiencies in current knowledge that have prime importance for checking HIV infection. Finally, we analyze the extent to which current federal programs are addressing these deficiencies.

AIDS education includes informing people about HIV transmission, as well as other activities to support behavioral changes related to disease prevention, such as testing to determine HIV antibody status and providing devices, including condoms to reduce sexual transmission, and bleach to reduce transmission through needle sharing. We have excluded aspects

of prevention that do not relate to people's voluntary behavior, such as research to develop vaccines and screening the blood supply. Education and individual behavior change are clearly important in the absence of effective medical interventions to prevent or cure HIV infection and AIDS. As shown by the history of and recent rise in syphilis rates, education and individual behavior will remain important even after effective therapeutic measures have been developed.

AIDS education has two purposes. First, educational programs are intended to influence people to adopt or maintain behavior that prevents HIV transmission. The second purpose is to maintain and promote social cohesion among the general population. Correcting misconceptions about HIV transmission may relieve anxieties among low-risk people and change attitudes toward those infected with HIV.

Effectiveness Of Education

General population. Both the general population and AIDS risk groups substantially improved their AIDS-related knowledge and changed their behavior before AIDS educational interventions were implemented. The experience of programs related to HIV transmission and to other public health concerns, however, suggests that education has the potential to promote further changes in knowledge and behavior.

Although several public health campaigns for the general population have not produced the behavior change desired, others have shown that education through the mass media can change health-related beliefs and behavior, especially when supplemented with interpersonal communication and development of skills to implement new beliefs and motivations.¹ As experience with AIDS education has shown, the media can set a social agenda by heightening public awareness of an issue and stimulating discussion. Factual information from the media can reduce misconceptions and fears about HIV transmission and can alert high-risk people to their susceptibility and direct them to more detailed information. Media presentations also can legitimize efforts to reduce the stigma associated with HIV infection and to prevent further spread of HIV.

A particular problem regarding AIDS education is the skepticism with which people regard messages from public health experts.² According to a National Center for Health Statistics (NCHS) survey in June 1988, 28 percent of those surveyed were doubtful about general AIDS information from federal public health officials, and 16 percent were doubtful about their advice on how to avoid getting AIDS.³ AIDS education also faces the problem of retaining people's interest and maintaining safer behavior over time.

Homosexual and bisexual men. Community-based education seeks to provide people with information, skills, and social support that promote behavior to reduce the spread of HIV infection. Some analysts have attributed the dramatic changes in sexual norms within the San Francisco homosexual community in part to community-based AIDS risk-reduction programs. The San Francisco model includes: (1) strong leadership from within the homosexual community; (2) market research to identify appropriate messages and communication channels for reaching the target audience; (3) implementation of programs to inform and motivate target audiences; (4) a focus on facilitating social and cultural change; (5) reliance on multiple channels of communication, including print and broadcast media and face-to-face interventions; and (6) broad-scale, grass-roots participation in program design and implementation.⁴

Unfortunately, there is limited evidence to link any aspect of the program to the behavioral change observed. Furthermore, given the unique composition of the San Francisco homosexual community, its model might not succeed in areas where homosexuals are not open about their sexual orientation and do not identify with the homosexual community. On the other hand, the success of San Francisco's community-based program is consistent with the results of similar programs to reduce pregnancy among teenagers and cardiovascular risk among the general population.

There is some evidence that homosexual men who have learned by voluntary testing programs that they are HIV antibody positive have reduced risky behavior more than men who have tested seronegative or who have remained unaware of their antibody status.⁵ Some studies indicate, however, that those learning of positive HIV antibody status have increased risky sexual behavior.⁶ Moreover, some mental health problems may be associated with learning of one's positive test results.⁷ In low-prevalence areas, tracing the sexual contacts of those testing positive and offering them counseling and testing may help identify individuals unaware that they are at risk. Behavioral follow-up could be incorporated into such programs to examine reduced high-risk behavior.

Special interventions are needed to assist those having difficulty adopting or maintaining safe sexual practices. Multisession, face-to-face programs show promise; however, longitudinal studies will be needed to assess their long-term impact on risky behavior.⁸

IV drug users. The most effective way for IV drug users to avoid HIV infection is to stop injecting drugs; for most, this requires formal drug treatment. The longer a person spends in treatment, the greater the reductions in IV drug use.⁹ A New Jersey program that provided vouchers for treatment got many IV drug users into long-term therapy.¹⁰

Furthermore, the program brought young black males into treatment, a group previously underrepresented in the state drug rehabilitation system because of financial barriers.¹¹ Although the threat of AIDS appears to be motivating IV drug users to enter treatment, further research on the long-term outcomes of drug treatments is needed.

A shortage of treatment programs has prevented some IV drug users from entering treatment, and some have rejected treatment as an option. For drug users who continue to inject, alternative approaches to reducing HIV transmission are to distribute bleach to clean drug-related devices and to exchange used needles for sterile ones. Almost half the IV drug users in a San Francisco project reported using bleach that was distributed.¹² It is not clear from the study design and the information available, however, whether using bleach slowed HIV spread. As of this writing, needle-exchange programs had not been officially attempted in the United States, although some are planned. Results from other countries suggest an increase in the use of such programs but do not indicate whether providing sterile needles has slowed HIV transmission.

Some uncertainty exists regarding the impact of IV drug users' learning of their HIV antibody status.¹³ More long-term follow-up is required to understand fully the impact of HIV testing in different areas. When testing is available, programs are needed to assist seropositive IV drug users to seek appropriate medical care and to minimize risk to others.

Changes in IV drug users' sexual behavior have been modest compared with changes in their drug-related behavior. Of special concern is the observation that changes in sexual behavior have been less frequent within committed relationships than within casual sexual relationships. Without using condoms or other forms of contraception, heterosexual partners may be infected and perinatal transmission may occur, since childbearing is more likely within longer-term relationships. Preliminary data from one study showed significant changes in condom use within long-term relationships when one-on-one counseling was provided.¹⁴

Heterosexual adults. No formal evaluations of AIDS educational programs implemented within clinics serving high-risk heterosexuals are available. Data are available, however, from educational programs implemented within STD clinics. Although one would expect patients' motivation to change behavior in the face of a treatable STD to be less than in the face of a fatal illness such as AIDS, some findings from evaluations of STD educational interventions may apply to AIDS. Studies in STD clinics suggest that special educational interventions can improve knowledge and can affect attitudes toward preventive behavior. Person-to-person interviews appear to be most effective, and the performance of the counselor affects clients' compliance. Thus, resources may be used effec-

tively to ensure the quality of those who provide AIDS and STD services.

Developing and providing interventions that are sensitive to cultural differences among minority groups merit particular attention. Also, innovative approaches are required to facilitate behavioral change for prostitutes, sexual partners of IV drug users, and other heterosexuals considered at high risk of HIV infection.

School-age youth. AIDS educational programs in schools have improved adolescents' knowledge, but their impact on changes in risky behavior has not yet been evaluated. The goals of sexuality education and AIDS education are similar: to reduce or modify teen sexual activities to curb teenage pregnancy and STDs other than AIDS, and to improve teens' sexual self-awareness and communication skills. It is therefore instructive to examine the evidence of success of these programs. Results from numerous evaluations indicate that sexuality education programs increase factual knowledge about sexuality and sexually transmitted disease but, in general, have little measurable impact on attitudes or behaviors.¹⁵ There are some important exceptions. One program taught communication and problem-solving skills through role playing and rehearsal. Another, a community-based program in rural South Carolina, used parents, churches, schools, other community organizations, and the media and seems to have lowered teen pregnancy rates.¹⁶ Further research to replicate these results is important because the contribution of different elements of the program is not clear, and the number of teenagers involved was small.

Although their knowledge may increase, there is little evidence that youth use such knowledge to change their behavior. Students may not consider HIV infection a personal threat because most teens do not know someone with AIDS. Some have suggested that information about AIDS be presented within the context of other, more prevalent STDs, such as gonorrhea and herpes simplex, with which adolescents may have greater familiarity.¹⁷ Programs most likely to succeed in changing adolescents' behavior are those that relate the information to their own lives and that use techniques such as role playing to teach communication skills and to reinforce new peer group norms.

AIDS educational efforts could be integrated into communitywide programs that reinforce the adoption of different behavior. That many adolescents become sexually active before high school suggests that educational programs be implemented in elementary and middle schools. Because some high-risk adolescents may not be reached through school-based AIDS educational interventions, programs could target adolescents in settings, such as juvenile detention centers and shelters for the homeless, that include teenaged runaways.

Federal Funding For AIDS Education

Knowledge about the effectiveness of AIDS education programs is insufficient. Problems range from study designs that do not permit evaluation of the effectiveness of interventions to lack of basic information on sexual practices. Although the experience in San Francisco is encouraging, we do not know whether its education programs can be replicated in other communities. Also, there remains inadequate knowledge about educational approaches that will reach certain subgroups of the population. In spring 1988, the congressional Office of Technology Assessment (OTA) reviewed ongoing federally funded AIDS education programs to see if they included an evaluation component that would allow researchers to assess program effectiveness.¹⁸ Here we discuss current gaps in knowledge and whether these recently funded AIDS education programs will help fill the gaps.

Designing studies for evaluation. Although experience indicates that public health campaigns can achieve knowledge and behavior change, it is not clear which components account for their effectiveness. AIDS education and related programs rarely have been designed to evaluate the effectiveness of interventions or to isolate the effects of different components. Many factors may influence a person's knowledge, attitudes, and behavior. Measuring the effectiveness of a specific program requires separating the effects of the program from those of other contributing factors. Research methods call for comparing changes within a group that received an intervention with changes within a control group. Researchers also may evaluate different educational strategies by comparing changes among groups that received different interventions. Rarely have such research designs been applied to evaluate AIDS education.

The National AIDS Information Campaign being conducted by the Centers for Disease Control (CDC) illustrates this situation. During fall 1987, the CDC distributed public service announcements to broadcast media throughout the country. NCHS conducted surveys of AIDS knowledge before and after the campaign. Nonetheless, it would be difficult to attribute any changes to the campaign as opposed to other information sources. The June 1988 NCHS survey gathered information useful to assess the CDC's mailing of an AIDS brochure to every U.S. household. About 47 percent of the respondents reported having read at least part of the brochure. The figures were lower, however, among blacks and people with less than twelve years' education (41 and 37 percent, respectively), primarily because fewer reported that their household had received the brochure.¹⁹

Other measures of the process of the campaign are also available to the

CDC. Although total press stories on AIDS decreased during the last quarter of 1987, television and radio continuously increased their broadcast of the CDC's public service announcements, and calls to the AIDS hotline rose greatly.²⁰ Correlations between the announcements and hotline calls within local areas could provide a measure of public response to the campaign. To evaluate the effectiveness of different components of the campaign, the CDC could vary systematically the content or dissemination of messages within an area. Different approaches might be tried within a state or across states. The insights gained could be used to increase the effectiveness of subsequent phases of the campaign.

Without appropriate research designs, it is difficult to interpret the results of evaluations that have been performed. It is also difficult to interpret the potential impact of a program if one does not know the characteristics of program participants and how they differ from the risk group at large. An educational program may appear to change risky behavior if one studies the experience of a group of self-selected program volunteers. Such success, however, may be a function more of the characteristics of the participants than of the program itself.

Some research projects recently funded by the federal government will employ research designs to avoid such potentially misleading results. For example, one investigator funded by the National Institute on Drug Abuse (NIDA) will randomly assign IV drug users admitted to a residential detoxification program to one of three different interventions to evaluate their relative effectiveness. Although such an approach may not always be feasible, careful design of the evaluation component of an educational intervention, before a program is implemented, is crucial to understanding which elements are effective and which are not.

Collecting information on risky behavior. Designing and targeting programs to promote safer practices requires having basic information about people's current behaviors. Data on sexual behavior of the U.S. population, however, are notoriously poor.²¹ To address these gaps, a national survey of American adult sexual behavior is being conducted with support from the National Institute of Child Health and Development and NCHS.²² Information from a representative group of 20,000 adults should be available by mid-1989. In addition, a 1987 survey of 11,000 eighth and tenth graders, funded by the Office of the Assistant Secretary for Health, the CDC, and NIDA, should provide information on adolescents' health knowledge, attitudes, and behavior regarding drug use.²³ Information about sexuality, however, relates only to knowledge and attitudes, not to behavior.

To gauge the effectiveness of educational programs, baseline information on the high-risk groups subject to interventions is necessary. Data on

prevalent homosexual practices, however, are available from only a few cities.²⁴ Many cities in the middle-to-high ranges of AIDS prevalence could benefit enormously from better estimates of sexual behavior among homosexual and bisexual men. Such data were collected in San Francisco and used to design educational campaigns and to identify pockets of unresponsive individuals.²⁵

Similarly, further ethnographic research (observations of a group's beliefs and practices by trained observers) would be useful to design and target interventions. Such research has yielded invaluable insight into drug use and patterns of social and sexual relationships that suggest new educational approaches. For example, the evident importance of peer group approval suggests that interventions aimed at a group of IV drug users rather than the individual might be effective. Similarly, the lack of significant change in sexual practices among IV drug users and their long-term partners suggests a need for involving sexual partners in counseling. Once promising interventions are implemented, appropriate methods need to be employed to evaluate their effectiveness.

Replicating the San Francisco experience. Improvements in AIDS-related knowledge and changes in behaviors documented in San Francisco cannot be linked to any particular component of the programs implemented there. Furthermore, even if the community-based intervention model used in San Francisco shifted community norms and contributed to behavioral change, the model needs to be replicated and evaluated in middle- and high-prevalence cities.

The extent of behavioral change in San Francisco may be attributable in part to unique population or community characteristics. Homosexual males in San Francisco, many of whom come from other areas, tend to be well-educated professionals who identify with the homosexual community. Numerous studies have found that response to knowledge of health risk is correlated with income and educational attainment.²⁶ Data are needed on the prevalence of high-risk behaviors among members of other socioeconomic strata, to assess the appropriateness of current programs for these individuals. In addition, community leadership and networks may be less well defined, and the community-based approach more difficult to implement, in other areas.

The CDC is funding community demonstration projects in six locations: Denver, Seattle-King County, Dallas County, New York State and City, Long Beach, and Chicago. These projects will collect data on the prevalence of certain behavior, but evaluation of the educational interventions appears to be limited to using surveys before and after the interventions. Such designs, however, do not permit separating the effects of the intervention from those of other influences.

Improving Knowledge Of Educational Effectiveness

Homosexual and bisexual men. Of all those at risk for AIDS, black and Hispanic homosexual men may be the least studied.²⁷ The limited data that are available suggest that race and ethnicity are not significantly related to participation in high-risk sex.²⁸ Blacks, however, appear to be at greater risk for seroconversion than whites.²⁹ Black homosexual men may be less informed about the AIDS epidemic than their white counterparts.³⁰ Given a relative lack of data regarding minority group members' AIDS-related knowledge, attitudes, and sexual practices, there are few clues about how to aim prevention strategies at alerting minority men to the dangers of high-risk behavior. Furthermore, minority group members' response to available educational interventions has not been adequately monitored. One study funded by the National Institute of Mental Health (NIMH) will document current and past levels of risky sexual behavior among black homosexual and bisexual men and identify effective risk-reduction methods.

Little attention also has been given to the problems of homosexual adolescents. Adolescents who are not yet infected with HIV and who are newly exploring homosexual lifestyles are among those most likely to benefit from preventive efforts.³¹ Limited information on the effectiveness of educational approaches in reaching homosexual/bisexual adolescents will be forthcoming from two federally funded projects, one from NIMH and the other from the CDC. These projects are targeted to agencies serving gay and lesbian youth or to adolescents seeking services at runaway shelters. Evaluations of the programs, however, will rely on pre- and postintervention assessments of attitudes and behaviors.

Specific data do not yet exist regarding the prevalence of male bisexuality in the population, the prevalence of HIV infection among this group, the degree to which they have been influenced by AIDS education, and the potential for spread of infection to heterosexuals by bisexuals. One NIMH-funded study will randomly assign members of high-risk groups (including bisexual men) seeking HIV antibody testing to one of three educational interventions and will be able to gauge their relative merits. Several CDC-funded longitudinal studies will monitor changes in knowledge, attitudes, behavior, and seroprevalence among cohorts that include homosexual and bisexual men. These CDC studies, however, will not be able to attribute definitively any changes observed to a particular educational intervention.

IV drug users. The threat of AIDS appears to have motivated many IV drug users to seek treatment. Research is needed to determine the long-term effectiveness of treatment programs for the increasing number of IV

drug users entering them. Several NIDA-funded programs target opiate users in and out of treatment and employ experimental designs to evaluate a variety of educational approaches and HIV antibody testing. These well-designed evaluations, which are still in progress, will yield assessments of program effectiveness. Because some IV drug users are at risk of AIDS by injecting drugs other than heroin, types of treatment that may eliminate or reduce their habits are also necessary.³²

HIV transmission continues to occur in areas where outreach workers have effectively distributed bleach. Since new infections have occurred in areas where only bleach distribution has been tried, researchers have suggested evaluating a combined program of bleach distribution and needle exchange.³³ Although needle-exchange programs remain controversial in the United States, their comparative worth or the effectiveness of using both interventions simultaneously could be evaluated.

Particular attention needs to be paid to educational interventions aimed at changing the sexual behavior of IV drug users, especially within long-term relationships. The effectiveness of various interventions on the sexual behavior of IV drug users and their sexual partners will be assessed in several projects funded by NIMH, NIDA, and the CDC. Some employ random assignment to different educational intervention groups.

For areas where there are few infected IV drug users, it is necessary to evaluate further a strategy for making voluntary HIV antibody testing easily accessible and providing intensive follow-up for those identified as seropositive. More information on the social consequences of being identified as seropositive and its effects on behavioral recidivism is needed, especially in light of evidence that IV drug users in treatment may return to drug use soon after learning of HIV infection.³⁴ Furthermore, evaluations are needed of innovative approaches to educating and counseling participants of voluntary HIV antibody testing in areas of both low and high HIV prevalence.

Heterosexual adults. Many persons attending STD clinics and seeking family planning services are at high risk of HIV infection; the diverse nature of this group requires innovative approaches to facilitate behavioral change. At the time of this analysis, very few evaluations were planned within STD and family planning clinics.³⁵ In such settings, evaluation in the following areas would assist in developing effective educational programs: protocols for risk assessment that may be used as a part of client education; acceptance of AIDS counseling and testing offered on site versus upon referral; various counseling approaches, such as individual and group counseling and support programs for infected and noninfected high-risk group members; client contraceptive choices following AIDS counseling and testing; and outreach to provide contra-

ceptive services to programs for IV drug use and STDs.

School-age youth. Since school-based AIDS education relies upon teachers, evaluations of programs that train teachers to communicate sensitive information are needed. Teachers who are uncomfortable discussing sexuality and specific sexual and drug-related behaviors are not likely to lead frank, open discussions.³⁶ The relative benefits of using peers or instructors from outside of the school system could provide direction to school-based programs. The CDC is funding School Health Education to Prevent the Spread of AIDS (SHEPSA) projects targeting educators, administrators, and school nurses as well as youth in school.

Nationally, about 25 percent of young people drop out of school before high school graduation, and the percentages are much higher in communities where AIDS is likely to be more prevalent.³⁷ In addition to school dropouts, other high-risk adolescents may not be reached through school-based AIDS education. Teen runaways, teens engaged in prostitution, and youths in juvenile detention will need to be reached through communitywide strategies.

Several CDC-funded projects are directed to agencies serving out-of-school youth. A few programs for runaways will assess attitudes and behavior before and after social skill training and information dissemination, but the designs of these evaluations will limit inferences about effectiveness. Evidence from the South Carolina study mentioned earlier suggests taking a similar approach to AIDS education. At the time of this review, no such comprehensive program was being evaluated.

Conclusion

Although the public's knowledge about AIDS has increased and unfounded fears have declined, it is not clear whether these changes have resulted from organized education programs or from other influences, including general media coverage. Perhaps it is not surprising that early education programs lacked rigorous research designs. Faced with a new and usually fatal disease, the immediate concern of organizations funding programs and public health workers implementing them was to curtail the spread of HIV infection. As a result, however, knowledge about the effectiveness of particular programs and of specific elements of programs has accumulated slowly.

Without insights from evaluation, those planning educational interventions cannot determine which components are vital for success and which can be eliminated. Such information is especially important because public health programs at all levels of government face restricted budgets; formulating AIDS education programs and allocating resources

among AIDS education and other health activities require knowledge of the effectiveness of different interventions.

Federally funded projects now under way address many of the barriers to determining which educational approaches are effective in changing behavior. Projects we have highlighted, sponsored by NIDA, NIMH, and the CDC, for example, are designed to assess the effectiveness of different interventions for IV drug users. In other areas, however, notably for people who attend STD clinics, study designs apparently will not permit evaluation of the effectiveness of different approaches.

For education to reach the intended audience, the content and dissemination of messages must be tailored to people at high risk. Since AIDS has affected large numbers of blacks and Hispanics, it is especially important that educational approaches reach people in these and other social and cultural groups. Within the Department of Health and Human Services, the Office of Minority Health and the CDC are planning special efforts targeted to people in minority groups. Given the importance of reaching people who are disadvantaged and members of minorities, we must evaluate these projects adequately and incorporate the findings into future educational programs.

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NOTES

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